

PROCEEDINGS
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NOTES ON THE MEADOW MICE *MICROTUS*
MONTANUS AND *M. NANUS* WITH DESCRIPTION
OF A NEW SUBSPECIES FROM COLORADO.

BY E. RAYMOND HALL.¹

Examination of the specimens of *Microtus montanus* and *M. nanus* accumulated in the Museum of Vertebrate Zoölogy shows that these two forms, currently treated as distinct species, intergrade and should be treated as subspecies of a single species. These specimens, particularly several series taken in 1933 by Miss Annie M. Alexander and Miss Louise Kellogg in Colorado, show also the existence of a heretofore unnamed geographic race in that State. The new race may be known as:

Microtus montanus fusus, new subspecies.

Type.—Male, adult, skin and skull; no. 61281, Mus. Vert. Zoöl.; 2½ miles east of summit of Cochetopa Pass, Saguache County, Colorado; September 21, 1933; collected by Annie M. Alexander; original no. 2568.

Range.—Rocky Mountain region north from Florida, southern Colorado, to Kinney Ranch, southern Wyoming.

Diagnosis.—Size: small (see measurements); tail relatively short, averaging 25 per cent of total length in a series of 7 topotypes; hind foot small. Color: reddish above with reduced amount of grayish. Skull: size small (condylobasal length averaging less than 27 mm.); bullae relatively uninflated; zygomatic breadth and mastoidal breadth relatively slight; brain case long and narrow.

Comparisons.—*M. m. fusus* shows approach to *M. m. arizonensis* in the distinctly reddish upper parts but is less reddish than *arizonensis*. At the same time *fusus* is much redder above than *caryi* or *nanus* which are grayish, or than *fucosus* or *micropus* which are blackish. In small size of skull, *fusus* resembles *nanus* but differs in relatively narrower skull, especially narrower, more nearly parallel-sided brain case, smaller bullae, and less elevated skull in the anterior frontal region. Also, in *fusus*, the anterior

¹ Contribution from California Museum of Vertebrate Zoölogy.

angle of each zygomatic arch is less acute than in other forms studied. Stated in another way, there is in *fusus* less projection anteriorly of the maxillary at the anterior angle of the zygomatic arch.

Measurements.—Average and extreme measurements of 5 topotypes (3 adults and 2 subadults) are as follows: Total length, 147 (140–156); length of tail, 36.2 (32.0–41.0); length of hind foot, 18.5 (18.0–19.0); condylobasal length, 26.0 (25.1–27.0); occipitonasal length, 25.0 (24.0–26.3); nasal length, 7.1 (6.6–8.2); zygomatic breadth, 14.1 (13.4–15.1); interorbital breadth, 3.6 (3.5–3.7); mastoidal breadth, 11.4 (11.1–11.6); length of upper molar series, 6.2 (6.0–6.4); breadth of rostrum, measured between ventral margins of infraorbital canals, 4.6 (4.4–4.9); palatilar length, 13.1 (12.5–14.3).

Specimens examined.—Total number 28; all in the Museum of Vertebrate Zoölogy, listed by counties from north to south, as follows:

WYOMING. *Sweetwater County*: Kinney Ranch, 23 mi. SW Bittercreek, 8.

COLORADO. *Gunnison County*: Deckers Ranch, Crested Butte, 2. *Saguache County*: 2 to 2½ mi. E of Summit of Cochetopa Pass, 10. *Alamosa County*: 1.6 mi. NE Medano Springs Ranch hdq., 1. *La Plata County*: Columbine Ranger Station, 8700 ft., Cascade Creek, 1; Florida, 6.

Remarks.—Intergradation with *M. m. caryi* is suggested by the larger bullae, broader brain case and sharper angle of the anterior end of the zygoma of the specimens from Kinney Ranch, Wyoming. Otherwise, and in the sum total of their characters, they are referable to *fusus*. The specimens from Florida and from Medano Ranch, southern Colorado, are intermediate in many respects between *arizonensis* and *fusus*, but all characters considered, seem to me better referred to *fusus*. Two other specimens having the reddish color of *fusus*, from Jensen, Uinta County, Utah, at the same time show an amount of blackish suggestive of *micropus*. They lack the grayish of *caryi* and *nanus*. Their greater size than in *nanus* or in *fusus*, and the more robust skull, with relatively large bullae and broad brain case, is further suggestive of *micropus*. Whatever better material from here shows these mice to be, they do indicate intergradation of *fusus* in this westerly direction with the larger sized mice currently identified as *micropus*.

In addition to the already mentioned specimens which provide evidences of intergradation between races heretofore assigned to one or the other of the two supposedly full species *Microtus montanus* and *Microtus nanus*, there are among others, 19 skulls with skins from Goose Creek, 5000 feet, 2 miles west of the Utah line, Elko County, Nevada. These are intermediate between *M. m. micropus* and *M. n. nanus*. Employing topotypes of *micropus* and specimens of *nanus* from the vicinity of Pocatello, Idaho (for precise localities see Whitlow and Hall, Univ. California Publ. Zoöl., vol. 40, p. 266, September 30, 1933), it is seen that the animals from Goose Creek closely resemble *nanus* in light color, small size of body and small size of most parts of the skull. However, in longer tail and hind foot, and wider rostrum, the series in question is intermediate between *nanus* and *micropus*. Even so, when all characters are taken into account the specimens from Goose Creek are nearer *nanus*. Other specimens from northern

Nevada, namely series from Mountain City, 7 miles northwest of Mountain City, and 20 miles south of Owyhee, though almost as small as those from Goose Creek, average darker colored, and the sum total of their characters places them with *micropus*. Continuing southward in Nevada additional specimens from 22 miles north of Deeth on Marys River and others from several localities farther southward in the Ruby Mountains (see Borell and Ellis, Journ. Mammalogy, vol. 15, p. 32, February 15, 1934) exhibit a gradual transition from the small gray-colored *nanus* to the larger blackish-colored *micropus*.

Microtus canicaudus Miller, with type locality at McCoy, Polk County, Oregon, may be only subspecifically distinct from the other voles of the *Microtus montanus* group. With this possible exception the systematic arrangement below is suggested as best expressing our present knowledge of the relationships of the several voles here listed. The type locality is given for each.

Microtus montanus canescens Bailey, Conconully, Okanogan County, Washington.

Microtus montanus nanus Merriam, Pahsimeroi Mountains, head of Pahsimeroi River, 9350 ft., Custer County, Idaho.

Microtus montanus caryi Bailey, Milford, Fremont County, Wyoming.

Microtus montanus fusus Hall, 2½ miles east of summit of Cochetopa Pass, Saguache County, Colorado.

Microtus montanus micropus Hall, Cleveland Ranch, 6000 ft., Spring Valley, White Pine County, Nevada.

Microtus montanus yosemite Grinnell, Yosemite Valley, 4000 ft., Mariposa County, California.

Microtus montanus montanus (Peale), Headwaters of Sacramento River, near Mount Shasta [probably close to Sisson (=Mount Shasta City), 3600 ft., Siskiyou County], California.

Microtus montanus dutcheri Bailey, Big Cottonwood Meadows, 10,100 ft., southeast of Mount Whitney, Inyo County, California.

Microtus montanus undosus Hall, Lovelock, Pershing County, Nevada.

Microtus montanus nevadensis Bailey, a big salt marsh below Watkins Ranch, Ash Meadows, Nye County, Nevada.

Microtus montanus fucosus Hall, Hiko, 4000 ft., Pahrnagat Valley, Lincoln County, Nevada.

Microtus montanus rivularis Bailey, St. George, Washington County, Utah.

Microtus montanus arizonensis Bailey, Springerville, Apache County, Arizona.